

ABSTRACT OF THE DISCLOSURE

[51] An ultracapacitor energy storage cell pack includes an ultracapacitor assembly including a plurality of parallel ultracapacitors and balancing resistors in series; an enclosure for the ultracapacitor assembly; a controller; one or more temperature
5 sensors; a pack voltage sensor; a GFI sensor; one or more cooling fans carried by the enclosure; an on/off relay coupled to the ultracapacitor assembly and the controller, the on/off relay activated by the controller during normal operation of the ultracapacitor assembly and deactivated by the controller when the GFI sensor detects a ground fault interrupt condition, the one or more temperature sensors detect an over-temperature
10 condition, or the pack voltage sensor detects an over-voltage condition; and a pre-charge resistor and a pre-charge relay coupled to the ultracapacitor assembly and the controller, and activated by the controller to cause the pre-charge resistor to limit pack charge current until the ultracapacitor assembly reaches a minimum voltage.